

SIX NEW SPECIES OF MALLOPHAGA FROM NORTH AMERICAN MAMMALS.

By E. A. MCGREGOR, Bureau of Entomology.

Trichodectes kingi n. sp.

Two females (Bishopp No. 2464) from weasel, *Putorius* sp., (Florence, Mont., June 16, 1910, coll. W. V. King), female and immature specimens (Bishopp No. 3181) from weasel (Florence, Mont., April 21, 1914, coll. H. P. Wood), and five females (Bishopp No. 3219) from weasel (Florence, Mont., April 18, 1914, coll. H. P. Wood).

This species is nearest *T. retusus* N. and *T. minutus* Paine. The former is from *Mustela vulgaris* and *M. erminea*, and the latter from *Putorius noveboracensis*. It differs materially from *T. retusus* in the entire absence of spines on the dorsal portion of the abdominal segments. It differs from *T. minutus* in the more elongate head, in the absence of dorsal abdominal spines, and in the rather distinct transverse, abdominal blotches.

Description of Female.—Total length, 1.139 mm.; length of head, .305 mm.; length of prothorax, .08 mm.; length of metathorax, .059 mm.; length of abdomen, .694 mm.; width of head across temples, .32 mm.; width of prothorax, .29 mm.; width of metathorax, .36 mm.; width of abdomen, .48 mm.

Head slightly wider than long, rather abruptly narrowed anteriorly, with a very distinct median emargination, and produced into a prominent trabecula-like process just before each antenna. Antennal sinuses of considerable longitudinal span, but very shallow. Ocular projections not prominent. Temple margins diverge slightly posteriorly and meet the occipital margin without an angle. Occipital margin of one even, rotundate curve from temple to temple. Antennal bands not decidedly distinct, separated from each other anteriorly by a rather wide, clear area, continued faintly across the antennal bases to the ocular blotch which is very distinct. A small triangular, posterior-pointing flap projects dorsally at the hind end of the distinct portion of the antennal bands. Occipital bands broad and distinct at their bases, continued narrower and fainter to the ocular blotches. Underlying bands are visible, extending from the bases of the occipital bands to the mandibles. Four short hairs occur on each anterior margin between the median emargination and the trabeculae, one weak hair arises from the eye and one immediately behind this, two long hairs at the temporal prominence, and three weak hairs between the latter and the prothorax. Antennae of average size, about reaching the posterior margin of the head; the three segments of about equal length.

Thorax about three times as broad as long. Prothorax lenticular in outline, with the posterior margin very slightly convex. Four weak spines distributed along the lateral margin. Metathorax at first abruptly diverging, than as abruptly converging, with a wide, angulated emargination medially. A very short spine at each posterior lateral angle, a long hair just behind this, and a similar hair midway on the converging margins. Legs normal.

Abdomen subquadrate in outline, widest on the third segment. Segments 1 to 6 with rather well defined plates at the lateral borders. Each of the twelve plates with a hair near the posterior angle. First segment devoid of spines. Second segment with a spine at each lateral border. Third to fifth segments each with a lateral group of three spines. Sixth and seventh segments each with a lateral group of four spines. Eighth segment with a transverse row of six spines, and with six spines on the posterior margin—three on either side of the center. Segment eight slightly, and segment nine deeply emarginate medially. Segments two to seven each with a spiracle at the lateral margins. Transverse spines lacking on segments one to seven, inclusive.

***Trichodectes floridanus* n. sp.**

Four females (McGregor, No. 9878) from dog, Monticello, Fla., November 26, 1913, coll. H. B. Scammell.

This species is nearest *T. latus* N., also of the dog, but is clearly distinct through the nature of the antennæ, the female appendages, the shape and markings of head, the shape of the thorax, and in the presence of the prominent spiracles on the prothorax.

Description of Female.—Total length, 1.5 mm.; length of head, .37 mm.; length of prothorax, .135 mm.; length of metathorax, .083 mm.; length of abdomen, .915 mm.; width of head between eyes, .551 mm.; width of prothorax, .405 mm.; width of metathorax, .488 mm.; width of abdomen, .811 mm.

Head just half again as wide as long, with a wide, shallow emargination anteriorly, and with the usual trabecula-like process just before each antenna. Antennal sinuses distinct, but not deep. Ocular projections distinct, but not prominent. Temporal margins commence to converge immediately behind the eyes, and meet the occipital margin with an obtuse curvature. Occipital margin rather concave for nearly the entire width of the prothorax. Antennal bands scarcely discernible, reduced to faint, linear spots at the posterior ends of the clypeal margins which are the darkest portions of the head. A crescent-shaped spot of about the color of the antennal bands occurs just inside each of the antennal sinuses. Occipital bands entirely lacking. Five short hairs occur on each of the clypeal margins, a similar hair occurs at the base of each trabecula just over which a longer hair arises, one short hair arises from each eye and one immediately behind this, two longish hairs near the temporal angle, three weak spines on each side

near the junction of the head and prothorax, and a long hair just mediad of these. Antennæ joints of nearly equal thickness, but with the third nearly equal in length to the other two.

Thorax about two and one-third times as wide as long. Prothorax rather lenticular in outline, with the median portion of the hind margin decidedly convex. A weak spine on each side at the outer ends of the anterior margin, and a stronger hair on each lateral margin just over the conspicuous, protruding spiracles, and a long hair on each side near the hind margin midway between the median line and the lateral border. Metathorax with rather abruptly converging sides, the conspicuously concave posterior margin forming nearly right angles with the lateral borders. A very short spine at each anterior lateral angle, three long hairs arising behind these so that bases form curves bending backward and inward from the spines at the angles. About eight hairs arise along the median part of the concave margin. Legs conventional.

Abdomen widely oval in outline, broadest on the second and third segments. First segment with a series of eight or nine hairs at the anterior margin medially, and with four or five spines along the lateral margin. Segments one to six, inclusive, with a stiff hair near each posterior lateral angle, and segments one to seven, inclusive, each with a transverse series of from sixteen to twenty four dorsal spines. Segments two to seven, inclusive, with a rather distinct spiracle on each lateral margin. Terminal segment rather deeply emarginate medially, with a central cluster of four dorsal spines, a transverse series of four weak spines, and a longer spine at the middle of each lateral border.

***Trichodectes thomomys* n. sp.**

Two females and one male (Bishopp No. 2604) from *Thomomys* sp., Jefferson, Colo., May 7, 1912, C. Birdseye, coll., and one immature specimen (Bishopp No. 2606) from the same host and locality, May 12, 1912.

This species is most nearly allied with *T. geomydis* Osb., from which it is easily distinguished by the absence of a process on the second joint of the female antennæ which are inserted before the middle of head; the straight, truncate hind margin of head; and by the shape of the metathorax.

Description of Female.—Total length, 1.111 mm.; length of head, .314 mm.; length of prothorax, .0837 mm.; length of metathorax, .0418 mm.; length of abdomen, .68 mm.; width of head across temples, .398 mm.; width of prothorax, .298 mm.; width of metathorax, .387 mm.; width of abdomen, .586 mm.

Head nearly a third again as wide as long, with a distinct, somewhat V-shaped median emargination, produced into stout, trabecula-like processes just before each antenna. Antennal sinuses only fairly deep, but of considerable longitudinal span. Ocular projections lacking. Temple margins at first are nearly parallel, but at their midpoints bend abruptly inward and meet the occipital margin at an obtuse angle.

Occipital margin almost a straight line. Antennal bands distinct, of moderate width, separated from each other at the front of head by the rather wide clear area coincident with the ample emargination at the borders of which they bend sharply backward for a short distance. Antennal bands continue clearly across the bases of the antennæ to the very distinct ocular blotches at which points they are continuous with the clearly defined occipital bands. Faint underlying bands extend from the bases of the occipital bands convergingly toward the mandibles. A broad band borders the occiput between the occipital bands. Five short hairs on each margin between the anterior emargination and trabeculæ, two on each side at the anterior border of the antennal sinus, one just within the posterior angle of antennal sinus, three longer hairs along the posterior half of temples, and eight weak spines on the dorsal surface of head. Antennæ rather stout, of three subequal joints, none of which possess a projecting process.

Thorax about three times as broad as long. Prothorax very short as compared to breadth. Sides divergent to posterior margin, which is somewhat 3-faceted. A strong spine at the posterior lateral angles and one near each end of the middle facet. Metathorax shorter than the prothorax and broader, the lateral border projecting on each side as a sharply rounding prominence, and with a wide, deep posterior median emargination. Three hairs set closely near the lateralmost portions and a transverse row of four stronger spines. Legs relatively short and stout.

Abdomen oval in outline, one-fifth longer than wide, widest on second segment. Segments one to three with pointed lateral plates which are directed inward and backward. Each lateral plate with a series of about five longish spines. First segment with two spines within the thoracic emargination, four or five short spines along the lateral margin, and a transverse series of about eighteen spines. Second segment with a series on each side—just inside the lateral plates—of about four weak spines, and a transverse row of about eighteen longer spines. Segment three with a transverse row of about seventeen long spines. Segment four with a transverse row of about thirteen spines, and on each side a series of about five spines. Segment five with about twenty-one spines in a transverse series. Segment six with a transverse series of about thirty spines. Seventh segment with three long spines at each posterior lateral angle, and a series of four placed medially. Segment eight with a transverse series of six long spines. Terminal segment subconical, sharply emarginate, and with four slender hairs subterminally. Seventh segment with a pair of chitinized, lateral female appendages.

Head of male a trifle wider relatively than that of female; anterior emargination deeper and more acute; antennal sinuses deeper; anterior angle of temple much more rounded; occipital margin somewhat concave.

Trichodectes monticolus n. sp.

Six females and two males (Bishopp No. 6837) from skunk, Topaz, Calif., September 15, 1916, coll. J. L. Webb.

This species, from the California Sierras, is nearest *T. mephitidis* Osb. from which it differs as follows: FEMALE.—A fairly well-developed angle at point of junction of temples with occiput; hairs on front of head; lateral borders of metathorax strongly converging, posterior border widely and deeply excavated. MALE.—Frontal emargination represented merely by a transparent spot; antennæ with basal joint not greatly longer than third, a pair of angulated processes on the basal and second joints at the dividing suture which are opposed to one another, terminal joint with a blunt spur on posterior margin near base; antennal sinuses more deeply excavated; temporal lobes more prominent.

Description of Female.—Total length, 1.07 mm.; length of head, .313 mm.; length of prothorax, .062 mm.; length of metathorax, .038 mm.; length of abdomen, .665 mm.; width of head across temples, .380 mm.; width of prothorax, .280 mm.; width of metathorax, .313 mm.; width of abdomen, .541 mm.

Head about one-fifth wider than long, rather generally rounded anteriorly, with a small but distinct median emargination, and with the usual trabecula-like flaps before each antenna. Antennal sinuses rather shallow. Ocular projections prominent. Temporal margins parallel one another for a short distance behind eyes, but soon converge to meet the occipital margin at an obtuse angle. Starting at these angles the occipital margin on either side first curves inward and then bends back again to form a strong median convexity. Antennal bands rather broad and very distinct, anteriorly bending abruptly at an acute angle to form expanded, backward-pointing bars which inclose a clear area behind the emargination, and continued distinctly across the antennal bases to the well-defined ocular blotch. A semicircular, hyaline flap projects backward, dorsally, just within that portion of the antennal bands lying abreast of the trabeculæ. Occipital bands at their bases broad and distinct, continued narrower and fainter about half way to the ocular blotches. Underlying bands are visible extending from the bases of the occipital bands to the mandibles. Five weak hairs occur on each anterior margin between the frontal emargination and the trabeculæ, one weak hair arises from the rear of the eye, five short hairs occur along the temporal margin, and one long hair arises on each side at the temporal-occipital angle. Antennæ of average size, the last joint the longest, but with no marked difference between them.

Thorax three and one-third times as wide as long. Prothorax sub-rectangular, with posterior margin slightly convex. A weak spine

at the posterior lateral angle, another just within the anterior angle, and a long spine arises on each side midway to the center. Metathorax at first abruptly diverging for a very short distance, and then as abruptly converging with a concave-bordered excavation medially. A short spine at the lateralmost points, three long spines along the converging sides, and eight longish spines along the border of the emargination. Legs normal.

Abdomen oval in outline, widest on the third and fourth segments. First segment with six short spines along each lateral margin, a series of eight across that part within the metathoracic excavation, and about twenty-two in a transverse series along the hind margin. Segments two to seven, inclusive, with transverse rows of spines as follows: Segment two, twenty-six spines; segment three, twenty-seven spines; segment four, twenty-two spines; segment five, eighteen spines; segment six, twenty spines (of very uneven length); segment seven, fourteen spines. Segment eight with a long hair within each of the chitinated appendages (arising from the seventh segment), and two weak hairs near the posterior tip.

Male.—Head one-third again as wide as long; antennal sinuses much deeper than those of female, and are nearly filled by the ample trabecula-like processes; temples narrower but more prominent; anterior median emargination represented merely by a transparent V-shaped spot. Antennæ with basal joint swollen; a pair of pincer-like processes on the basal and second joints opposed to one another across the dividing suture; last joint with an obtuse-angled spur on inner margin near base.

Trichodectes scleritus n. sp.

Numerous females and immature individuals (McGregor No. 4321) from gopher, Florida.

This species is somewhat intermediate between *T. geomydis* Osb. and *T. californicus* Chapm., probably nearest the former as figured by Kellogg and Ferris. Very distinct through the following characters: Hooked trabeculæ; presence of posterior prominence on second and third antennal joints; conspicuous lateral sclerites on first to fifth abdominal segments, inclusive.

Description of Female.—Total length, 1.04 mm.; length of head, .284 mm.; length of prothorax, .092 mm.; length of metathorax, .042 mm.; length of abdomen, .625 mm.; width of head across temples, .412 mm.; width of prothorax, .298 mm.; width of metathorax, .341 mm.; width of abdomen, .575 mm.

Head almost half again as wide as long, generally rounded anteriorly with a conspicuous, semicircular median emargination, and produced into a hooked trabecula-like appendage at the base of the antennæ. Antennal sinuses moderately deep and wide. Ocular projections not very prominent. Temple margins diverge little, and soon curve convergingly to meet the occipital margin, forming with it rather

prominent lobes. Occiput very slightly convex. Antennal bands not very distinct, separated from one another anteriorly by the ample emargination at the sides of which they bend abruptly backward as darker bars; continued faintly across the antennal bases to the fairly distinct ocular blotch. Occipital bands barely discernible, paling to invisibility half way to the ocular blotches. Underlying bands are seen extending from the bases of the occipital bands to the base of mandibles at which point occurs on each side a small dark blotch. Three hairs arise from the front margin on each side of the median emargination, two arise midway to the trabeculæ, three just before the antennæ, two on each side from clear areas just within the clypeal margin, a hair arises from the eye, four occur along the temple, one at each lateral end of the occipital margin, and six weak hairs occur near the central portion of the dorsal aspect. Antennæ of generous dimensions, the second and third joints with posterior prominences.

Thorax two and two-thirds as broad as long. Prothorax trapezoidal, the sides diverging posteriorly, with slightly convex posterior margin. A short spine at the posterior lateral angle, and four weak hairs near the middle. Metathorax with conspicuous lateral extensions, then abruptly converging to the evenly concave posterior margin. Two shortish spines on the lateral wings, a long hair just behind these, and a transverse series of six long hairs. Legs about as usual.

Abdomen oval in outline, widest on the third segment. Segments one to five inclusive with conspicuous lateral plates. Plates I with three marginal spines and one dorsal spine; plates II with two marginal and three dorsal spines; plates III with three marginal and two dorsal spines; plates IV with three marginal and one dorsal spine; plates V with three long submarginal hairs. Segment one with two median spines just behind the thoracic border, and with a transverse series of about eleven spines. Segment two with a transverse series of about fourteen spines. Segment three with a transverse series of about eighteen spines. Segment four with a transverse series of about seventeen spines. Segment five with about fifteen spines in a transverse series. Segment six with a transverse row of about seventeen spines. Segment seven with four long hairs near the posterior lateral angle and two near the middle. Segment eight with a lateral series at each side of three spines each just within the female appendages, and with six weaker ones near the notched tip.

***Trichodectes odocoilei* n. sp.**

Three females (Bishopp No. 2468) from White-tailed deer (*Odocoileus virginianus macrourus*), Lolo Hot Springs, Mont., June 23, 1910, coll. W. V. King.

This species agrees fairly well with *T. tibialis* Piag. as figured by Morse and by Osborn, but it is very distinct from the original description and figure of Piaget, especially in the following characters: Point of insertion of antennæ; front of

head not with "multitude" of hairs as Piaget states for tibialis; shape of thorax (especially metathorax); general outline of abdomen; character of abdominal blotches; the distribution of dorsal spines; and in the markings on the eighth and ninth abdominal segments.

Description of Female.—Total length, 1.72 mm.; length of head, .492 mm.; length of prothorax, .102 mm.; length of metathorax, .102 mm.; length of abdomen, 1.025 mm.; width of head across temples, .471 mm.; width of prothorax, .369 mm.; width of metathorax, .430 mm.; width of abdomen, .533 mm.

Head slightly longer than wide, unusually elongate, truncate anteriorly by a wide, shallow emargination, and produced into the trabecula points just before the antennæ. Antennal sinuses shallow. Ocular projections quite noticeable. Temple margins at first parallel one another, then curve abruptly inward to the occipital margin with which they do not form angles. The occiput is nearly straight, but slight emarginations occur just mediad of the bases of the occipital bands. Antennal bands broad and distinct, bending abruptly inward just before the bases of the antennæ and not continued to the inconspicuous ocular blotch, bent directly backward at the lateral angles of the anterior emargination, forming bars which reach to the mandible bases. A backward-pointing triangular plate which is narrowly cleft to the apex fills the space between the truncated front and the mandibles. Occipital bands narrow and faint, paling before reaching the antennal bands. Between the bases of the occipital bands are a pair of sharply recurved blotches. Two short hairs occur on the truncate front, two at each of the frontal angles, seven along the outer margin of the antennal bands, five on the temples, eight in a curving row in front of the mandibles, and a dozen disposed dorsally on the posterior half of the head. Antennæ long, slender, the second joint the longest, the third slightly curving.

Thorax twice as broad as long. Prothorax roughly rectangular, with posterior margin slightly convex with a weak median concavity. A conspicuous spiracle at each lateral border. A weak spine just before each spiracle, a similar one at each posterior lateral angle, and a pair near the middle of the segment. Metathorax with sides first diverging and ten parallel, posterior margin running slightly forward to form an obtuse-angled emargination. A short spine at each posterior lateral angle, and ten along the posterior border of which four are long and six short. Legs conventional.

Abdomen with sides sub-parallel, widest on third segment. Segments two to seven, inclusive, with conspicuous lateral spiracles. Segments one to seven, inclusive, with dusky, transparent blotches which are separated from the lateral bands of similar color by narrow, clear spaces. Segment eight with a pair of smoky, elliptical blotches. Segments one to six, inclusive, with a short hair in front of the posterior lateral angles; segment seven with a longer hair at the angles. Seg-

ments one to seven, inclusive, each with a transverse series of short spines as follows: Segment one, seventeen spines; segment two, twenty-one spines; segment three, seventeen spines; segment four, sixteen spines; segment five, sixteen spines; segment six, eighteen spines (two at each side longer); segment seven, ten spines (one at each side longer). The eighth segment with a transverse series of six spines, the outer two of which are long, and with four arising at the tip which is sharply notched. All of the abdominal spines arising from clear pustulations.

EXPLANATION OF PLATES.

PLATE XVI.

- Fig. 1. Female of *Trichodectes monticolus* n. sp.
- Fig. 2. Head of male of *Trichodectes monticolus* n. sp.
- Fig. 3. Left leg III of female of *Trichodectes floridanus* n. sp. (viewed ventrally).
- Fig. 4. Left leg III of female of *Trichodectes monticolus* n. sp. (viewed ventrally).
- Fig. 5. Female of *Trichodectes floridanus* n. sp.
- Fig. 6. Antenna of male of *Trichodectes monticolus* n. sp.

PLATE XVII.

- Fig. 1. Female of *Trichodectes kingi* n. sp.
- Fig. 1a. Antenna of female of *Trichodectes kingi* n. sp.
- Fig. 2. Female of *Trichodectes thomomyus* n. sp.
- Fig. 3. Head of male of *Trichodectes thomomyus* n. sp.
- Fig. 4. Right leg III of female of *Trichodectes thomomyus* n. sp. (viewed ventrally).
- Fig. 5. Female of *Trichodectes scleritus* n. sp.
- Fig. 6. Right leg II of female of *Trichodectes kingi* n. sp.
- Fig. 7. Female of *Trichodectes odocoileis* n. sp.

The drawings have been made through the employment of the camera lucida with little attempt to restore symmetry.